

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



03 FEB 2004



(43) International Publication Date
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number
WO 2004/014964 A3

- (51) International Patent Classification⁷: **C08F 14/18**, G03C 1/73 (74) Agent: SINNOTT, Jessica, M.; E. I. DU PONT DE NEMOURS AND COMPANY, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, DE 19805 (US).
- (21) International Application Number: PCT/US2003/025022 (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 8 August 2003 (08.08.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/402,350 9 August 2002 (09.08.2002) US
60/440,504 16 January 2003 (16.01.2003) US
- (71) Applicant (for all designated States except US): E. I. DU PONT DE NEMOURS AND COMPANY [US/US]; 1007 Market Street, Wilmington, DE 19898 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): FEIRING, Andrew, E. [US/US]; 7 Buckridge Drive, Wilmington, DE 19807 (US). SCHADT, Frank, L., III [US/US]; 2407 Delaware Avenue, Wilmington, DE 19806 (US). PETROV, Viacheslav Alexandrovich [RU/US]; 2 Cappa Court, Hockessin, DE 19707 (US). SMART, Bruce, Edmund [US/US]; 22 Beethoven Drive, Wilmington, DE 19807 (US). FARNHAM, William, Brown [US/US]; 123 Dewberry Drive, Hockessin, DE 19707 (US).
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 18 March 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 2004/014964 A3

(54) Title: PHOTORESISTS, FLUORINATED POLYMERS AND PROCESSES FOR 157 nm MICROLITHOGRAPHY

(57) Abstract: This invention provides novel fluorine containing polymers which comprise at least one fluorinated olefin, at least one polycyclic ethylenically unsaturated monomer with a fused 4-membered carbocyclic ring and, optionally, other components. The polymers are useful for photoimaging compositions and, in particular, photoresist compositions (positive-working and/or negative-working) for imaging in the production of semiconductor devices. The polymers are especially useful in photoresist compositions having high UV transparency (particularly at short wavelengths, e.g., 157 nm) which are useful as base resins in resists and potentially in many other applications.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25022

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C08F 14/18; G03C 1/73

US CL : 526/250; 430/270.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 526/250; 430/270.1; 526/247; 526/255; 430/325; 430/326; 430/907; 430/331; 430/914

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPAT, USPG-PUB, EPO, JPO, DERWENT

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,229,473 A (KOBO et al) 20 July 1993 (20.07.1993), abstract, line 1-40; column 1, line 65 - column 2, line 60; column 2, line 50-60; column 6, line 42 - column 7, line 12; column 8, line 46-58. Claims 1-5.	1-5
Y	US 2,928,865 A (BRASEN) 15 March 1960 (15.03.1960), column 2, line 21-70; column 9, line 19-28 and 46-54.	1-45
Y	US 2002/0119398 A1 (DESIMONE et al) 29 August 2002 (29.08.2002), paragraphs 0101-0115 and 0087-0096. Column 6-45.	6-45

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

08 December 2003 (08.12.2003)

Date of mailing of the international search report

23 JAN 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

David W. Wu

Telephone No. (703) 308-2351